



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
|-----------------|-------------|----------------------|---------------------|------------------|

10/598,737

09/08/2006

Hideaki Sasaki

W1878.0238

9667

32172 7590 03/27/2012  
DICKSTEIN SHAPIRO LLP  
1633 Broadway  
NEW YORK, NY 10019

EXAMINER

ESSEX, STEPHAN J

ART UNIT

PAPER NUMBER

1727

MAIL DATE

DELIVERY MODE

03/27/2012

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/598,737 | <b>Applicant(s)</b><br>SASAKI ET AL. |  |
|                              | <b>Examiner</b><br>STEPHAN ESSEX     | <b>Art Unit</b><br>1727              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on \_\_\_\_; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 5) ☒ Claim(s) 15-38 is/are pending in the application.
- 5a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 6) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 7) ☒ Claim(s) 15-38 is/are rejected.
- 8) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 9) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☒ The drawing(s) filed on 08 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/6/2011, 9/14/2006</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 15-17, 20-24, 27-32, 34, 35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson et al. (hereinafter "Wilkinson") (U.S. Pub. No. 2002/0006534A1) in view of Hibino et al. (hereinafter "Hibino") (U.S. Pub. No. 2003/0094002A1).

**Regarding claims 15, 17, 22, 24 and 37**, Wilkinson teaches an electrochemical fuel cell power generation system comprising a plurality of fuel cell assemblies (fuel cells comprising fuel electrodes) arranged in a fuel cell stack **10**, a fuel supply subsystem **38** (vaporized fuel supply section) and a heat transfer liquid supply subsystem **42** (see paragraph 60) wherein a two-phase fuel supply stream comprising a

Art Unit: 1727

heat transfer liquid and a gaseous fuel is directed to the fuel cell assemblies within the fuel cell stack (liquid fuel supply system) (see paragraph 53). The fuel supply subsystem **38** comprises a fuel tank (fuel container) that contains fuel and may additionally comprise a reformer or other fuel processing equipment for producing a gaseous hydrogen-containing stream from a hydrocarbon source (see paragraph 67). The heat transfer liquid subsystem **42** comprises a reservoir containing a heat transfer liquid such as methanol (see paragraphs 20 and 65).

Hibino teaches a gas liquefying and storing system (fuel container) which stores methane dissolved in a hydrocarbon solvent, wherein a storage container **10** comprising a vapor-phase portion **12** (vaporizing chamber; vaporizing section) and a liquid-phase portion **16** (fuel storage chamber; fuel placing section) is furnished with a vapor-phase outlet **14** (fuel gas supply port) for discharging the methane from the vapor-phase portion **12** of the container **10** (supplying a vaporized fuel having a higher concentration than the concentration of the liquid fuel supplied to the fuel electrode) (see paragraphs 160; 161). Hibino teaches that methane stored in a super-critical state by the gas liquefying and storing system described above can be used to supply energy to fuel cells (see paragraph 247). It would have been obvious to utilized the gas liquefying and storing system of Hibino in the fuel cell subsystem of Wilkinson because Hibino teaches that methane may be reformed more efficiently such that a smaller fuel tank is sufficient for storing the methane-bearing butane fuel for supplying a given amount of energy (see paragraphs 248 and 249).

**Regarding claims 16, 23, 29, 31 and 34**, Hibino teaches that the vapor-phase outlet **14** (fuel gas supply port) is provided with a vapor-liquid separator **130** (gas liquid separating section) to separate and withdraw an amount of liquid hydrocarbon solvent (see paragraph 300).

**Regarding claims 20 and 27**, the courts have held that the use of separable construction instead of the structure disclosed in the prior art would merely be a matter of obvious engineering choice. See *In re Dullberg*, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961) (see MPEP § 2144.04, C.).

**Regarding claims 21, 28, 30, 32 and 35**, Wilkinson teaches that a valve **41** (openable and closable shutter member) may be used to shut off the fuel supply stream and/or regulate the amount of fuel supplied to the fuel cell stack **10** (see paragraph 67).

4. Claims 18 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson in view of Hibino as applied to claims 15-17, 20-24, 27-32, 34, 35 and 37 above, and further in view of Yamauchi et al. (hereinafter "Yamauchi") (U.S. Pub. No. 2004/0013928A1).

**Regarding claims 18 and 25**, Wilkinson and Hibino are silent to the fuel storage chamber and the vaporizing chamber being partitioned by a gas liquid separating film.

Yamauchi teaches a gas liquid separate container (fuel container) which incorporates a partition board **61** for separating a gas compartment **60a** (vaporizing chamber) from a liquid compartment **60b** (fuel storage chamber), wherein a gas-liquid separation membrane (gas liquid separating film) is disposed in part or whole of the

Art Unit: 1727

partition board **61** (see paragraph 89). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a partition board including a gas-liquid separation membrane in the gas liquefying and storing system of Wilkinson and Hibino because Yamauchi teaches that it prevents the gas and liquid from mixing even when the container is turned upside down (see paragraph 89).

5. Claims 19 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson in view of Hibino as applied to claims 15-17, 20-24, 27-32, 34, 35 and 37 above, and further in view of Mann et al. (hereinafter "Mann") (U.S. Pub. No. 2004/0076861A1).

**Regarding claims 19 and 26**, Wilkinson and Hibino are silent to the fuel being a solidified material of an organic liquid fuel.

Mann teaches a fuel storage area **104** (fuel storage chamber) for storing a fuel containing substance **106** wherein the fuel containing substance is provided with a gelling agent (solidified material of an organic liquid fuel) (see paragraph 25). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized a gelling agent in the modified fuel supply subsystem of Wilkinson and Hibino because Mann teaches that the gelling agent makes the fuel viscous enough to remain in the fuel storage area without substantial leakage regardless of the orientation of the fuel storage area (see paragraph 25).

Art Unit: 1727

6. Claims 33, 36 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkinson in view of Hibino as applied to claims 15-17, 20-24, 27-32, 34, 35 and 37 above, and further in view of Fisher et al. (hereinafter "Fisher") (U.S. Pub. No. 2003/0190504A1).

**Regarding claims 33 and 36**, Wilkinson and Hibino are silent to a fuel collecting section and a mixing tank.

Fisher teaches a fuel cell system wherein recycled anode fuel (collecting a residual fuel) flows from fluid flow field **722** (fuel collecting section) to return to a mixing chamber **740** (mixing tank) (see paragraph 100). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the fluid flow field and mixing chamber of Fisher in the modified electrochemical fuel cell power generation system of Wilkinson and Hibino in order to more efficiently consume fuel without waste.

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHAN ESSEX whose telephone number is (571)270-7866. The examiner can normally be reached on Monday - Friday, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on (571) 272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1727

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SJE/

/Barbara L. Gilliam/  
Supervisory Patent Examiner, Art Unit 1727